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**Figure 1: Nucleic Acid coding sequence human histamine H4**

ATGCCAGATACTAATAGCACAATCAATTACTAAGCACTCGTGTACTTAGCATT  
TTTATGTCCTAGTAGCTTGTATAATGCTAGGAATGCTTGGCATTTAGCTTGT  
TGGTGGACAAAAACCTAGACATCGAAGTAGTTATTTTCTTAACTTGCCATCTCTG  
ACTTCTTGTTGGGTGTGATCTCCATTCTTGTACATCCCTCACACGCTGTTGAATGGG  
ATTTGGAAAGGAATCTGTATTTGGCTCACTACTGACTATCTGTATGTACAGCAT  
CTGTATATAACATTGTCCTCATCAGCTATGATCGATACCTGTCAAGTGTGT  
CTTATAGAACTCAACATACTGGGGTCTGAAGATTGTACTCTGATGGTGGCCGTTGG  
GTGCTGGCCTTCTAGTGAATGGGCAATGATTCTAGTTAGCTAGTCTGGAGGATGA  
AGGTAGTGAATGTGAACCTGGATTTTCGGAATGGTACATCCTGCCATCACATCATT  
CTTCCAATTCTGTGATCCCAGTCATCTAGTCGTTATTCAACATGAATATTATTGGAG  
CCTGTGGAAGCGTGTACATCTCAGTAGGTGCCAAGGCCATCCTGGACTGACTGCTGTCT  
CTTCCAACATCTGTGGACACTCATTAGAGGTAGACTATCTCAAGGAGATCTTTCTG  
CATCGACAGAAGTCCCTGCATCCCTCATTCAGAGAGACAGAGGAGAAAGAGTAGTCTC  
ATGTTTCCCTCAAGAACCAAGATGAATAGCAATACAATTGCTTCCAAAATGGGTTCCCTT  
CTCCCAATCAGATTCTGTAGCTCTCACCAAAGGGAACATGTTGAACTGCTTAGGCCA  
GGAGATTAGCCAAGTCACTGGCATTCTTAGGGGTTTGCTGTTGCTGGCTCCAT  
ATTCTCTGTCACAATTGCTTCAATTATTCTCAGCAACAGGTCTAAATCAGTTG  
GTATAGAATTGCAATTGGCTTCAGTGGTTCAATTCTTGTCAATTCTCTTTGTATCCA  
TTGTGTCACAAGCGCTTCAAAAGGCTTCTGAAAATATTGTATAAAAAGCAACC  
TCTACCATCACAACACAGTCGGTCAGTATCTCTTAA

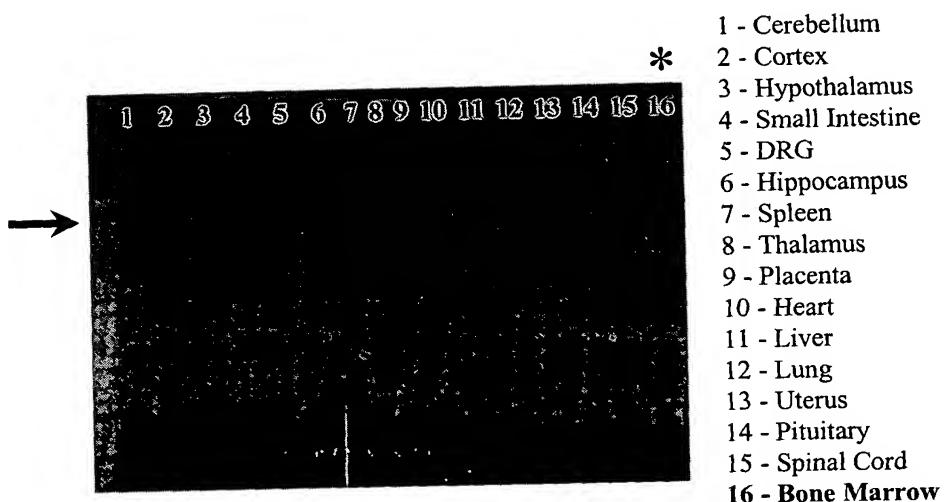
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**Figure 2: Amino acid sequence human histamine H4 receptor**

Met Pro Asp Thr Asn Ser Thr Ile Asn Leu Ser Leu Ser Thr Arg Val Thr Leu  
Ala Phe Phe Met Ser Leu Val Ala Phe Ala Ile Met Leu Gly Asn Ala Leu Val  
Ile Leu Ala Phe Val Val Asp Lys Asn Leu Arg His Arg Ser Ser Tyr Phe Phe  
Leu Asn Leu Ala Ile Ser Asp Phe Phe Val Gly Val Ile Ser Ile Pro Leu Tyr  
Ile Pro His Thr Leu Phe Glu Trp Asp Phe Gly Lys Glu Ile Cys Val Phe Trp  
Leu Thr Thr Asp Tyr Leu Leu Cys Thr Ala Ser Val Tyr Asn Ile Val Leu Ile  
Ser Tyr Asp Arg Tyr Leu Ser Val Ser Asn Ala Val Ser Tyr Arg Thr Gln His  
Thr Gly Val Leu Lys Ile Val Thr Leu Met Val Ala Val Trp Val Leu Ala Phe  
Leu Val Asn Gly Pro Met Ile Leu Val Ser Glu Ser Trp Lys Asp Glu Gly Ser  
Glu Cys Glu Pro Gly Phe Phe Ser Glu Trp Tyr Ile Leu Ala Ile Thr Ser Phe  
Leu Glu Phe Val Ile Pro Val Ile Leu Val Ala Tyr Phe Asn Met Asn Ile Tyr  
Trp Ser Leu Trp Lys Arg Asp His Leu Ser Arg Cys Gln Ser His Pro Gly Leu  
Thr Ala Val Ser Ser Asn Ile Cys Gly His Ser Phe Arg Gly Arg Leu Ser Ser  
Arg Arg Ser Leu Ser Ala Ser Thr Glu Val Pro Ala Ser Phe His Ser Glu Arg  
Gln Arg Arg Lys Ser Ser Leu Met Phe Ser Ser Arg Thr Lys Met Asn Ser Asn  
Thr Ile Ala Ser Lys Met Gly Ser Phe Ser Gln Ser Asp Ser Val Ala Leu His  
Gln Arg Glu His Val Glu Leu Leu Arg Ala Arg Arg Leu Ala Lys Ser Leu Ala  
Ile Leu Leu Gly Val Phe Ala Val Cys Trp Ala Pro Tyr Ser Leu Phe Thr Ile  
Val Leu Ser Phe Tyr Ser Ser Ala Thr Gly Pro Lys Ser Val Trp Tyr Arg Ile  
Ala Phe Trp Leu Gln Trp Phe Asn Ser Phe Val Asn Pro Leu Leu Tyr Pro Leu  
Cys His Lys Arg Phe Gln Lys Ala Phe Leu Lys Ile Phe Cys Ile Lys Lys Gln  
Pro Leu Pro Ser Gln His Ser Arg Ser Val Ser Ser

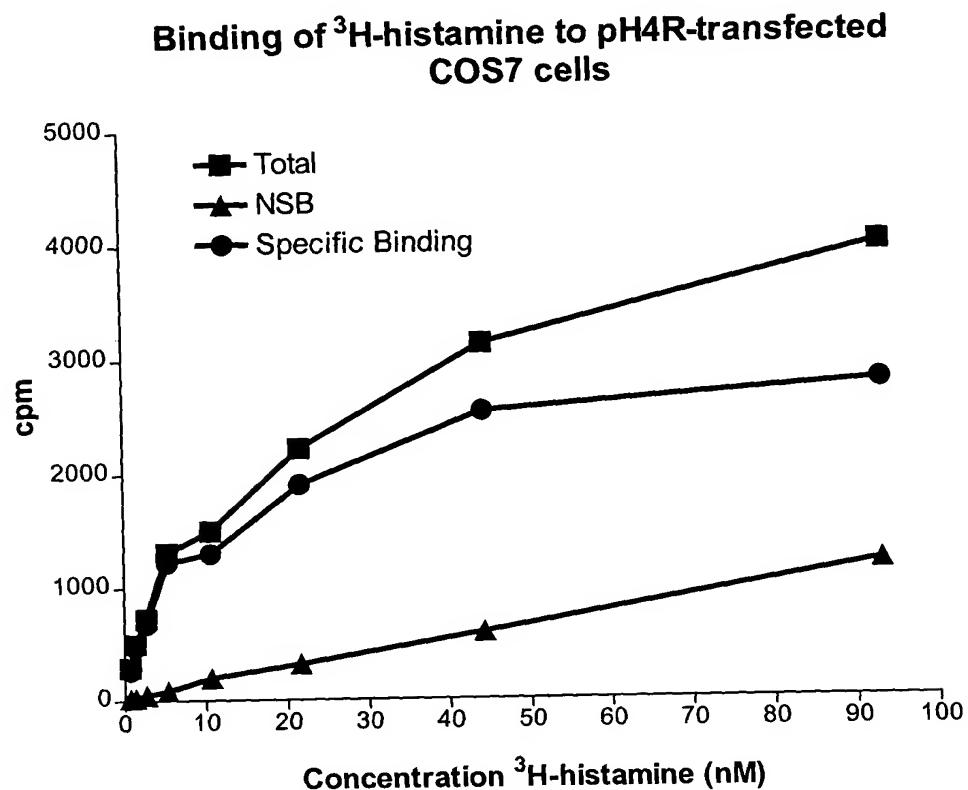
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**Figure 3: Tissue Distribution of human histamine H4 receptor**



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**Figure 4: Binding of [<sup>3</sup>H]-histamine to pH4R expressing COS7 cells.**



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**FIGURE 5A**

**Mouse H4 DNA coding region (SEQ.ID.NO.:5)**

```
ATGTCGGAGTCTAACAGTACTGGCATTTGCCACCAGCTGCTCAGGTCCCCTGGCATTAAATGT
CTTCATTTGCCTTGCTATAATGGTAGGCAATGCTGTGGTCATCTTAGCCTTGTGGTGGACAGAAA
CCTTAGACATCGAAGTAATTATTTTTCTAATTGGCTATTCTGACTTCCTCGTGGGTTGATT
TCCATTCCCTGTACATCCCTCACGTGTGTTAACTGGAATTGGAAAGTGGAACTGCAATTGTTT
GGCTCATTACTGACTATCTTGTGCACCGCATCTGTCTACAATTGTCCTCATTAGCTACGATCG
ATACCAGTCAGTTCAAATGCTGTCTTATAGGGCTAACACACTGGCATCATGAAGATTGTTGCT
CAAATGGTGGCTTTGGATACTGGCTTCTGGTAAATGGCCCGATGATTCTGGCTCAGATTCTT
GGAAGAACAGCACGAACACAAAGGACTGTGAGCCTGGTTGTACAGAGTGGTACATCCCTCACC
TACAATGCTTTGAAATTCTGCTTGTCTCATCTGTGGCTTATTCATGTACAGATTACTGG
AGCCTGTGGAAGCGTAGGGCTCTCAGTAGGTGCCCTAGCCATGCTGGATTCTCCACTACCTCTCCA
GTGCTCAGGACACTTACACAGAGCTGGGTGGCTTGCAAGGACAAGTAATCCTGGATTGAAGGAATC
AGCTGCATCTCGTCACTCAGAAAGTCTCGAAGAAAGAGCAGCAGCATCCTGGTGTCTTAAGGACTCAC
ATGAACAGCAGTATCACTGCCTCAAAGTGGGTTCTGGCGATCGGAAAGTGCAGCGCTTCGCC
AAAGGGAGTACGCAGAGCTCTCAGAGGCAAGGAGCTAGCCAGGTCACTGGCATCCTCTGAGCGC
TTTGGCATTGCTGGGCTCCATACTGCTGTTCACAATTGTCCTTCAACTTACCCAGAACGGAA
CGCCCCAAATCGGTGTGGTACAGCATTGCCCTCTGGCTGCAATGGTTCAATTGTTGTAATCCCT
TTCTGTACCCCTTGTGTCACAGGCCTTCCAGAAGGCTTCTGGAAAGATACTTGTGACAAAGCA
ACCAGCGCTGTACAGAACAGTCAGTATCTTCTTGA
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**FIGURE 5B**

Rat H4 DNA coding region (SEQ.ID.NO.:6)

```
ATGTCGGAGTCTAACGGCACTGACGTCTGCCACTGACTGCTCAAGTCCCCTGGCATTAAATGT
CCCTGCTGCTTGCTATAACGATAGGAATGCTGTGGTCACTTAGCCTTGAGCAGACAGAAA
CCTTAGACATCGAAGTAATTATTTTTCTAATTGGCTATTCTGACTTCTCGTGGTGTATC
TCCATCCTCTGTACATCCCTCACACGCTGTTAACTGGAATTGGAAAGTGGAACTGCATGTTT
GGCTCATTACTGACTATCTTGCGACAGCATCCGTACAGTATTGCTCATTAGCTACGATCG
ATACCAGTCAGTTCAAACGCTGTGCGTTAGAGCACAGCACACTGGCATCCTGAAAATTGTTGCT
CAAATGGTGGCTGTTGGATACTGGCTTCTGGTCAATGGCCAATGATTCTGGCTCGGATTCTT
GGAAGAACAGCACCAACACAGAGGAGTGGCAGGCTGGCTTGTACTGAGTGGTACATCCTGCCAT
TACAGCATTCTGGAATTCTGCTCCCTGTCCTGGTGGTCTATTCACTGTTACAGATTACTGG
AGCCTGTGGAAGCGTGGGAGTCTCAGTAGGTGCCCTAGCCACGCTGGATTATCGTACACCTCTCCA
GGGGCACTGGACACTCACGAGAACTGGGTTGGCTTGTAGGACAAGTCTCCTGGATTAAAGGAACC
AGCCGCATCCCTTCATTCAAGAAAGTCCACGAGGAAAGAGCAGTCTCCTGGTGTCTTAAGGACTCAC
ATGAGCGGTAGTATCATCGCCTCAAAGTGGGTTCCCTCTGCCATCAGAAAGCCCAGTGCTTCACC
AGAGAGAGCACGTGGAGCTCTCAGAGGCAGGAAGCTAGCCAGGTCGCTAGCTGTCTCCTGAGTGC
TTTGGCATTGCTGGCTCCGTATTGCTGTTCAACATTGTTCAACTTATCGCAGAGGGGAG
CGCCCCAAATCGATTGGTACAGCATGCCCTGGCTACAGTGGTCAATTCACTTATTAAATCCCT
TTCTATACCCCTTGTGCCACAGACGTTCCAGAAGGCTTCTGGAAGATACTCTGTGTGACAAAGCA
ACCAGCACCTCACAGACCCAGTCAGTATCTTCTTGA
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**FIGURE 5C**

Guinea Pig H4 DNA coding sequence (SEQ.ID.NO.:7)

```
ATGTTGGCAAATAACAGTACAATGCCCTAACATCAATTAAAATTCTTGACATTTTA  
ATGTCTTACTAGCTATTGCTATAATGTTAGGCAATGCGTGGTCATTTAGCTTTATTG  
TGGACAGAAATCTTAGACATCGAAGTAATTACTTTCTTAACCTGCCATTGCAGACT  
TCTTGTTGGGTGCAATTGCAATTCCCTGTACACACCTCCTCGCTGACTTACTGGACTT  
CTGGAAAGCAAGCTGTGATTTGGCTCATTACTGACTATCTTTATGtACAGCATCTGT  
GTATAATATTGTCCTCATCAGCTACGATCGCTACCACTGAGTCTCAAATGCCGTGTGGTA  
TAGAGCTCAGCACTCTGGCACCTGGAAAATTGCTACTCAGATGGTGGCTGTTGGATAT  
TCTCCTCATGACAAATGGGCCATGATTCTGATTTCAAGCTTCTGGCAGAATAGCACT  
ACAGAAATGTGAACCTGGATTTAAAAAAGTGGTACTTTGCTCTCCCTACATCATTATTG  
GAATTCTGATCCCCATCTGTTAGTTGCTTATTCAGGCCCATTTACTGGAGCCTG  
TGGAAAGCGAGAGAAACTGAGCAGGTGCCTCAGCCACCCGTACTCCCTCTGACTCTTC  
CAGCAGTGACCACGGACACTCCTGCAGACAGGGACCCGATTCAAGGGCGACTCTGCCA  
GCACGGAAAGAAACAAC TGCCCTCTTGTTAGACAAGTCACGGAGAAAGAGCAGTC  
TCTTGTTCCATAAGAGCCTACAAGAACAGCAATGTGATCGCTTCCAAAATGGGCTTC  
CTCTCCCACTCAGATTCCCTGGCTCTCAGCAAAGGAACATATCGAACTTTCAGAGC  
CAGGAAATTAGCCAAGTCACTGGCCATACTCTAGCAGCTTTGCCATTGCTGGGCTCC  
ATATTCACTGACTACAGTTACTCATTCTTGCTGAAAGGAACCTGACTAAATCAAC  
CTGGTACCAACTGCCTTGGCTCCAGTGGTCAATTCTTGTAAATCCCTTTGTAT  
CCATTGTGTCACAAACGTTTCAAAGGCTTCTGAAAATACCTCCTGTGAGAAGGCA  
ATCCACGCCACCACACAACCGCTCAATATCCACTTGA
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**FIGURE 6A**

Mouse histamine H4 receptor protein sequence (SEQ.IDN.NO.:8)

MSESNSTGILPPAAQVPLAFLMSSFAFAIMVGNAVVILAFVVDRNLRHRSNYFFLNLAISDFL  
VGLISIPLYIPHVLFNWNFGSGICMFWLITDYLCTASVYNIVLISYDRYQSVSNAVSYRAQH  
TGIMKIVAQMVAVVWILAFLVNGPMILASDSWKNSTNTKDCEPGFVTEWYILTITMLLEFLLP  
VISVAYFNVQIYWSLWKRRALSRCPSHAGFSTTSSASGHLHRAGVACRTSNPGLKESAASR  
HSESPRRKSSILVSLRTHMNSSITAFKVGSFWRSESAALRQREYAELLGRKLARSLAILLSA  
FAICWAPYCLFTIVLSTYPRTERPDKSVWYSIAFWLQWFNSFVNPFYPLCHRRFQKAFWKIL  
CVTKQPALSQNQSVSS

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**FIGURE 6B**

Rat histamine H4 receptor protein sequence (SEQ.ID.NO.:9)

MSESNGTDVLPLTAQVPLAFLMSLLAFAITIGNAVVILAFVADRNLRHRSNYFFLNLAISDFF  
VGVISIPLYIPHTLFNWNFGSGICMFWLITDYLCTASVYIVLISYDRYQSVSNAVRYRAQH  
TGILKIVAQMVAWWILAFLVNGPMILASDSWKNSTNTEECEPGFVTEWYILAITAFLEFLLPV  
SLVVYFSVQIYWSLWKRGSLSRCPSHAGFIATSSRG TGHSRRTGLACRTSLPGLKEPAASLH  
SESPRGKSSLVSLRTHMSGSIIFKVGSFCSRSESPV LHQREHVELLGRKLARSLAVLLSAF  
AICWAPYCLFTIVLSTYRRGERPKSIWYSIAFWLQWFNSLINPFLYPLCHRRFQKAFWKILCV  
TKQPAPSQTQSVSS

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**FIGURE 6C**

Guinea Pig histamine H4 receptor protein sequence (389 amino acids)  
(SEQ.ID.NO.:10)

MLANNSTIALTSIKISLTFLMSLLAIAMILGNVVVILAFIVDRNLRHRSNYFFLNLAIA  
DFFVG  
AIAIPLYIPSSLTYWTSGKQACVFWLITDYLLCTASVYNIVLISYDRYQSVSNAVWYRAQHS  
GTWKIATQMVAVVIFSFMNTNGPMILISDSWQN  
NSTTECEPGFLKKWYFALPTSLLEFLIPILLV  
AYFSAH<sup>I</sup>YWSLWKREKLSRCLSHPVLP  
SDSSSDHGHSCRQDPDSRATLPARKETTASLGSD  
KSRRKSSLLFSIRAYKNSNVIASKMGLSHDSLALQQREHIELFRARKLAKSLAILAAFAIC  
WAPYSLTTVIYSFFPERNLTKSTWYHTAFWLQWFNSFVN  
PFLYPLCHKRFQKAFLKILPVRR  
QSTPPHNRSIST

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**Figure 7A**  
**Nucleotide Sequence Comparison of Human (SEQ ID NO:1), Guinea Pig (SEQ ID NO:7), Mouse (SEQ ID NO:5), and Rat H4 (SEQ ID NO:6)**

**Figure 7B**

Human: CCATATCTCTTCACATTCATTTTCAATTCTCAGCAACAGGTCCCTAAATCAGTTGGTATGAAATTGCATTGGCTCAGTGGTCAATTCCTTGTAATCCTCTTTTG 1071  
Guinea Pig: CCATATTCACATGACTACAGTATCTCATTTTTCCTGAAAGGAACCTTGACTAAATCAACCTGGTACCATATCGCCCTTTGCTCCACTGGTCAATTCCTTG 1071  
Mouse: CCATATCTGCTCTTCACATTCATTTTCAATTCTCAGCAACAGGTCCCTAACTTACCCAGAACGGAAAGGCCAAATGGTGGTACGCAATGGTCAATGGTCAATTCCTTG 1077  
Rat: CGTATGCCCTTCACATGTTCTCAACTTATCGATTTCTCAACTTATCGATTTCTCAACTTATCGATTTCTCAACTTATCGATTTCTCAACTTATCGATTTCTCA 1077  
Human: TATCCATTGTTGACAAAGCGCTTCTCAAGGGCTTCTGAAATAATTGTTGATAAAAAGCACTTACCATCACAAACAGCTGGTCAAGTATCTCTDA 1173  
Guinea Pig: TATCCATTGTTGACAAACGTTCTCAAGGGCTTCTGAAATAACTCTCTGAGAAGGCAATCCACCCACA - - - CACAACGGCTCATATGCCATG 1170  
Mouse: TACCCATTGTTGACAGGGCTTCTGAAAGTACCTTGTTGACAAAGGAAACGGCTGTCACCTGTTGACAAAGGAAACGGCTGTCACCTGTTGAC 1176  
Rat: TACCCATTGTTGACAGACGTTCTCAAGGGCTTCTGAAAGTACTCTGTTGACAAAGGCAACGGACCTCA - - - CAGACCCAGTCAAGGACCTCA 1176

**Figure 8**  
**Amino Acid sequence Comparison of Human (SEQ ID NO:2), Guinea Pig (SEQ ID NO:10),  
 Mouse (SEQ ID NO:8) and Rat H4 (SEQ ID NO:9)**

Human:	MPDTNSTINSLSTRYTLAFFFMSLYAFAAIMLGNALVILAAFVVDKNNLRHSSYFFLNLAISDFFGVISIPLIYIPHTLFEDFGKEICCVFMLTTDYLCTA	100
Guinea Pig:	MIAANNSTTAIT-STKISLTFELMSLJATAIMLGNNVVVLLAFTIVDRNLRHRSNYFFLNLAIADEFVGAIAPPLYIPSSLTYWTSKGKOACVFMLTDLCLCTA	99
Mouse:	MSESNSTGILIPPAQVPIAFIMSSPAFAIMVGNAYVAVVLLAFTVVDRLNRHRSNYFFLNLAISDFFLVGLISIPLIYIPHVLFWNNFGSGICMFMLTDLCLCTA	100
Rat:	MSESNGTDVLPFLTAQVPLAFLMSLLAFAITIGNAVVLLAFTVADRNLRHRSNYFFLNLAISDFFGVISIPLIYIPHTLFNWNFGSGICMFMLTDLCLCTA	100
<b>Consensus:</b>	<b>M . . N . T . L . : : : L . F . M S L . A : A D M : G N : V I L A F : D : N L R R S : X F F I N L A I : D F : V G . I : I P L Y I P : . L . W . G . : C : F W L . T D Y L I C T A</b>	<b>TM2</b>
Human:	SVYNIVLISYDRYLSVSNAVSYRTQHTGYLKIVTLMVAWWLAFLVNGPMILVSESWKDEG-S-ECEPGFFSEWYIILAITSFLEFVIVPILVAYFNMNIY	198
Guinea Pig:	SVYNIVLISYDRYQSVSNAVWYRAOHSGTWNKIAATOMVAVWIFSEMTNGPMILISDSWQNST-T-ECEPGFLKKWFALPTSLLEFLIPILLVAVYFSAHY	197
Mouse:	SVYNIVLISYDRYQSVSNAVWYRAOHGTGIMKIVAQMVAVWILAFLVNGPMILASDSWKNSTNTKDCEPGFTVTEWYIILTITMFLFLPVSLVYFSVQIY	200
Rat:	SVYSIVLISYDRYQSVSNAVWYRAOHGTGILKIVAQMVAVWILAFLVNGPMILASDSWKNSTNTCEECPGFTVTEWYIILAFTAFLFLPVSLVYFSVQIY	200
<b>Consensus:</b>	<b>SVYNIVLISYDRY SVSNAY YR:QH:G. KI... MYAVW: :E: NGPMIL: S: SW: :... : CEPGE: .WY: :.T: :LEF: :P: :.VAYF: :.IX</b>	<b>TM5</b>
Human:	WSLMKRDKHLSRCQSHPGPGL-TAVVSNICGHSSFRGRLSSRSLSASTEVPASFHSERQRKKSSLMFSSRTKMSNTIASKMGFSQSOSDVALHQREHVELLR	297
Guinea Pig:	WSLMKREKLRSRCRCLSHPVLPVLDSSSSDGHSCRDQDPSRATLPARKETTASLGSDSKSRKSSLFLSIRAYKNSNVIAKMGFLSHSDSLALQREHIELFR	297
Mouse:	WSLMKRALSRCPSSHAGE-STTSSSSASAGHLHRAGVACRTSNPGLKEASAARHSESPRKSSILIVSLRTHMNSSITAFKVGSFWRSESAALRQEYAEELLR	299
Rat:	WSLMKRGSLSRCPSSHAGE-ITASSRGTGHSRRTGLACRTSLPGLKEPAASLHSESPRGKSSLVLSLRTHMSGSIIAFKVGSFCRSESPVILHQIEHVELLR	299
<b>Consensus:</b>	<b>WSLMKRCR: LSRC SH: : . SS. GH. R : : . E. AS: S: R. KSSL: :S: :R. KSSL: :S: :L: Q E: :EL: R</b>	<b>TM4</b>
Human:	ARRLAKSLAILLGVFACWAPYSLFTIVLSTYSSATGPKSVMWYRIAFWLOWENSFVNPLLYPLCHKRFQKAFLKIKFCIKKQPLPSQHSRSVSS	390
Guinea Pig:	ARKLAKSLAILLAFAICWAPYSLTTVYSSFPERNLTGSTWYHTAFWLOWENSFVNPLLYPLCHKRFQKAFLKILPVRROSTPP-HNRSIST	389
Mouse:	GRKLAKSLAILLSAFAICWAPYCLFTIVLSTYSPRTERPKSVMWYRIAFWLOWENSFVNPLLYPLCHRRFQKAFLKILCVCVKOPALSO-NQSVSS	391
Rat:	GRKLAKSLAILLSAFAICWAPYCLFTIVLSTYRGERPKSIVWYRIAFWLOWENSFVNPLLYPLCHRRFQKAFLKILCVCVKOPAPSQ-TQSVSS	391
<b>Consensus:</b>	<b>.R: LA: SLA: LII: .EA: CWAPY: L: T: : S : : . KS: WY: .AFWLOWENS: :NP: LYPLCH: RFQKAF.KI: : : : Q: : : : RS: S:</b>	<b>TM7</b>